

APPENDIX C

AIR QUALITY IMPROVEMENT PROGRAM (AQIP) AND LOW CARBON TRANSPORTATION GREENHOUSE GAS REDUCTION FUND (GGRF) INVESTMENTS

ZERO-EMISSION DRAYAGE TRUCK DEMONSTRATION PROJECT

HYDROGEN REFUELING STATION REQUIREMENTS

I. MINIMUM TECHNICAL REQUIREMENTS

To be eligible under this Solicitation, applications that include proposed hydrogen refueling stations to be funded as part of the project must, at a minimum, meet each of the following minimum technical requirements. ARB will only process applications for infrastructure projects where the project is proposed to be sited where similar infrastructure already exists (e.g., installing a hydrogen refueling station at an existing fueling station or industrial facility).

A. Hydrogen Quality

Hydrogen dispensed at the station(s) shall meet the requirements in the Society of Automotive Engineers (SAE) International J2719: 2011, "Hydrogen Fuel Quality for Fuel Cell Vehicles" (www.sae.org). The hydrogen refueling stations must undergo and pass the hydrogen purity test to become considered to be operational and tested every 6 months and when the hydrogen lines are potentially exposed to contamination due to maintenance or other activity.

B. Fueling Protocols

The station(s)/dispenser(s) shall meet the appropriate SAE International Technical Information Report (TIR) for the vehicles or equipment being fueled (e.g., J2601/2 and/or J2601/3) (www.sae.org).

C. Fire and Safety Awareness, Prioritization, and Adherence

To the extent practicable and with consideration of local ordinances, applicants should use the following as a guideline for hydrogen refueling station design:

- National Fire Protection Association (NFPA) 2: Hydrogen Technologies Code: 2011, <http://www.nfpa.org>

D. Dispenser Pressure

Each hydrogen refueling station shall dispense fuel at a minimum of 350 bar and follow the appropriate SAE International fueling protocol (e.g., J2601/2 for on-road hydrogen vehicles and J2601/3 for off-road hydrogen vehicles).

E. Hydrogen Dispensing

The Applicant must demonstrate the ability to dispense hydrogen per "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices" as adopted by the 97th National Conference on Weights and Measures 2012, U.S. Department of Commerce, National Institute of Standards and Technology (NIST), Handbook 44: 2013.

Hydrogen dispenser performance specifications must satisfy NIST Handbook 44: 2013, unless superseded by California Department of Agriculture (CDFA), Division of Measurement Standards Rulemaking: California Code of Regulations (CCR) 3.39 “Hydrogen Gas-Measuring Devices -- Tentative Code” (as proposed for replacement through public review processes).

F. Hydrogen Technologies Code

The station/dispenser(s) shall be capable of meeting or exceeding the National Fire Protection Association (NFPA) 2: Hydrogen Technologies Code: 2011, www.nfpa.org.

G. Station Design Requirements

Hydrogen refueling stations must be designed to allow the hydrogen refueling station to accept delivery of hydrogen fuel from a mobile refueler or hydrogen tube trailer if on-site hydrogen production goes off-line. The applicant must provide a detailed plan, equipment list, and performance specifications to show they are able to obtain and contract an effective station bid from an experienced supplier.

H. Renewable Hydrogen

Applications must demonstrate compliance with the minimum Renewable Hydrogen Requirements (Section II of this Appendix). This compliance may contain all stations for which the applicant has received State funding in addition to any funded under this Solicitation.

II. RENEWABLE HYDROGEN REQUIREMENTS

Applications that include funding for proposed hydrogen refueling stations must provide a plan for dispensing at least 33% renewable hydrogen. This plan must describe how each station or portfolio of stations in the application expects to dispense at least 33% renewable hydrogen on a per kilogram basis over the applicant’s portfolio of State-funded stations (this can include previously State-funded agreements).

A. Eligible Renewable Feedstocks

Eligible renewable feedstocks include:

- Biomethane or biogas such as: biomass, digester gas, landfill gas, sewer gas, or municipal solid waste gas.
- Other feedstocks may be eligible if the Application demonstrates that the proposed feedstock is sustainably produced, reduces greenhouse gas emissions compared to the petroleum baseline, and achieves the ARFVTP sustainability goals contained in 20 CCR 3101.5.

B. Eligible Renewable Electricity Sources

Eligible renewable electricity sources include facilities that use the following:

- Fuel cells using renewable fuels
- Geothermal
- Small hydroelectric (30 megawatts or less)
- Ocean wave
- Ocean thermal
- Tidal current
- Photovoltaic (PV)
- Solar Thermal
- Wind
- Biomass digester gas
- Municipal solid waste conversion (non-combustion thermal process)
- Landfill gas
- Renewable Energy Certificates (RECs)

C. Required Information

Applications must include information about the source of the feedstock(s) and/or process electricity (i.e., electrical power used to run a system); how the feedstocks will be processed into fuel; and how the fuel will be transported, stored, and ultimately dispensed at the proposed station(s). If the primary process energy for hydrogen production is electricity (e.g., for electrolysis), applicants must describe a direct source of eligible renewable electricity or source of renewable energy certificates (RECs) that are registered and verifiable through Western Renewable Energy Generation Information System (WREGIS) or an equivalent tracking and verification system. Further information about WREGIS can be found at: www.wecc.biz/WREGIS.

For each station, applicants must submit the following information: Year, name of pathway, amount of hydrogen dispensed annually per station (in kilograms), biogas/renewable feedstock (in standard cubic feet), and renewable electricity (in kilowatt hours), assumptions and calculations on an energy equivalent basis that demonstrate that on a “well to wheel” evaluation that the required percent of the energy used to produce, deliver, dispense and use hydrogen was from renewable feedstock. Applicants should use the energy economy ratio (EER) value of 2.5 (relative to gasoline) from the Low Carbon Fuel Standard (LCFS) regulation to account for the fuel cell vehicle efficiency. For further information, see: www.arb.ca.gov/fuels/lcfs/lcfs.htm.

D. Renewable Electricity Requirements

Applicants planning to use renewable electricity for system power must describe how they intend to use new renewable electricity capacity with the electricity either going directly to the hydrogen production system or connected to the grid (within the Western Electricity Coordinating Council --- WECC). Applicants planning to use renewable

electricity for system power must describe how the electricity will be dedicated and used for the hydrogen production. Alternatively, applicants purchasing and utilizing eligible renewable electricity credits must describe how the credits will be dedicated and used for the hydrogen production.

E. Biogas Requirements

Applicants planning to use biogas for system power must describe how they will either produce or purchase biogas (certified as renewable) that will be delivered directly to their hydrogen production facility or injected into a pipeline system. If the purchased biogas will be injected into a natural gas pipeline distribution system, applicants must show that a physical pathway exists by providing documentation that proves that the purchased biogas could be transported from the injection point to the hydrogen plant (that supplies the hydrogen for the applicant's stations).

F. Utilization of Previously Funded Stations

Hydrogen refueling stations previously funded by the State may be included in the portfolio of stations to meet the renewable hydrogen requirement. The ARB award recipient may utilize the amount of renewable hydrogen from these previously funded stations.

G. Contingency Plans if not all Proposed Stations Recommended for Funding

Applicants must account for the possibility that not every proposed station will be recommended for funding. Therefore, applicants must describe whether and how their renewable hydrogen plan would change depending on the number and location of stations ultimately awarded. Applicants should include information about whether and how costs will change depending on the portfolio of stations ultimately awarded grant funding. For example, the applicant shall specify whether different technologies or more expensive equipment would be used depending on the combination of stations awarded.

H. Verification

The ARB will verify whether the renewable hydrogen requirement is met.

I. SB 1505 Disclaimer

The 33% Renewable Hydrogen Content requirement is a condition to participate in this Solicitation. This is separate and distinct from ARB's sole authority to regulate the renewable hydrogen content requirements for hydrogen refueling stations under Health and Safety Code, Section 43869 (commonly referred to as Senate Bill 1505 or SB 1505). Fulfilling the 33% Renewable Hydrogen Content requirement in this Solicitation does not guaranty or warranty in any way that hydrogen refueling stations funded under this Solicitation will meet any standards or regulations that ARB may

adopt in the future for hydrogen refueling stations pursuant to the authority in SB 1505. The applicant will be solely responsible for complying with such standards and regulations as applicable, including funding its compliance with them.

J. Greenhouse Gas Requirements

Applicants must use “well to wheel” calculation methodology for the greenhouse gas emission calculations that include the feedstock of the hydrogen, the production of the hydrogen, and the use of the hydrogen.” See Appendix D for the emission reduction and cost-effectiveness methodology.